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JUL 25 2005

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Witzgall

Art Unit: 2674

Serial No.: 09/469,070

Examiner: Abdulselam, A.

Filed: 12/21/1999

Docket No. TI-23879

For: ELECTRO-OPTICAL, TUNABLE, BROADBAND COLOR MODULATOR

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Witzgall	
TITLE OF INVENTION:	
ELECTRO-OPTICAL, TUNABLE, BROADBAND COLOR MODULATOR	
FILE NO.:	DEPOSIT ACCT. NO.:
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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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## APPEAL BRIEF TRANSMITTAL

25 July 2005

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Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

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*Charles A. Brill* 25 July 2005

Charles A. Brill Date

Transmitted herewith is an Appeal Brief in the above-identified application.

Please charge the \$500.00 fee for filing the Brief to the deposit account of Texas Instruments Incorporated, Account No. 20-0668.

Charge any additional fees, or credit overpayment to Deposit Account No. 20-0668.

Respectfully submitted,

*Charles A. Brill*

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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

JUL 25 2005

Applicant: Witzgall

Art Unit: 2674

Serial No.: 09/469,070

Examiner: Abdulselam, A.

Filed: 12/21/1999

Docket No.: TI-23879

For: ELECTRO-OPTICAL, TUNABLE, BROADBAND COLOR MODULATOR

**APPEAL BRIEF UNDER 37 C.F.R. § 41.37**

25 July 2005

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*Charles A. Brill* *25 Jul 4 2005*

Charles A. Brill  
Date

Dear Sir:

The following Appeal Brief is respectfully submitted in connection with the above-identified application in response to the Final Rejection mailed 23 February 2005, and the Advisory Action mailed 18 May 2005. Please charge all required fees, including any extension of time fees, to the deposit account of Texas Instruments Incorporated, Deposit Account No. 20-0668.

**REAL PARTY IN INTEREST**

The real party in interest is Texas Instruments Incorporated, to whom this application is assigned.

**RELATED APPEALS AND INTERFERENCES**

There are no related appeals or interferences known to the Applicant's legal representative.

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## STATUS OF THE CLAIMS

This application was originally filed on 21 December 1999 with ten claims, three of which were written in independent form. No claims have been allowed. Claim 10 was amended on 21 February 2002. Claims 11-13 were added on 17 June 2003. Claim 1 was amended on 22 March 2004.

Claims 1-13 have been finally rejected and are the subject of this appeal.

## STATUS OF THE AMENDMENTS

A reply was filed 22 April 2005 that did not amend the claims. The Examiner indicated the reply would be entered for purposes of appeal.

## SUMMARY OF CLAIMED SUBJECT MATTER

Lines 5-9 and 14-19 of page 3 of the specification provide a concise explanation of the invention defined in the appealed claims, which recite a color modulator, a display system using a color modulator, and a method of creating full-color images. The color modulator is comprised of a stack of dielectric layers and transparent electrodes. A voltage applied to the electrodes filters incident white light, allowing wavelengths in a given passband—a beam of colored light—to pass through the color modulator. Line 4 of page 8, through line 4 of page 10 of the specification further describe the operation of the color modulator. The voltage applied to the electrodes alters the electric field that the electro-optical material is exposed to. The electric field determines the index of refraction of the material. The index of refraction of each layer determines the passband of the dichroic filter. As described in line 12 of page 10 through line 16 of page 12, color filters are built up of several layers of the electro-optical material and transparent electrodes. As with dichroic filters, the thickness of the layer and the index of refraction of the layer combine to control what wavelengths are allowed to pass through the layer

and which wavelengths are reflected by the layer. Thus, wavelengths of a given color band can be allowed to pass to create a colored light beam.

### **GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

1. Whether Claim 1 is unpatentable under 35 U.S.C. § 103 (a) over U.S. Patent No. 6,309,073 to Nakayama *et al.* in view of U.S. Patent No. 6,232,717 to Oida *et al.* and in further view of U.S. Patent No. 6,252,638 to Johnson *et al.*
2. Whether Claim 2 is unpatentable under 35 U.S.C. § 103 (a) over U.S. Patent No. 6,309,073 to Nakayama *et al.* in view of U.S. Patent No. 6,232,717 to Oida *et al.* and in further view of U.S. Patent No. 6,252,638 to Johnson *et al.*
3. Whether Claim 3 is unpatentable under 35 U.S.C. § 103 (a) over U.S. Patent No. 6,309,073 to Nakayama *et al.* in view of U.S. Patent No. 6,232,717 to Oida *et al.* and in further view of U.S. Patent No. 6,252,638 to Johnson *et al.*
4. Whether Claim 4 is unpatentable under 35 U.S.C. § 103 (a) over U.S. Patent No. 6,309,073 to Nakayama *et al.* in view of U.S. Patent No. 6,232,717 to Oida *et al.* and in further view of U.S. Patent No. 6,252,638 to Johnson *et al.*
5. Whether Claim 4 is unpatentable under 35 U.S.C. § 103 (a) over U.S. Patent No. 6,309,073 to Nakayama *et al.* in view of U.S. Patent No. 6,232,717 to Oida *et al.* and in further view of U.S. Patent No. 6,252,638 to Johnson *et al.*
6. Whether Claim 7 is unpatentable under 35 U.S.C. § 103 (a) over U.S. Patent No. 6,492,065 to Nakagaki *et al.* in view of U.S. Patent No. 5,992,320 to Kosaka *et al.*
7. Whether Claim 8 is unpatentable under 35 U.S.C. § 103 (a) over U.S. Patent No. 6,492,065 to Nakagaki *et al.* in view of U.S. Patent No. 5,992,320 to Kosaka *et al.*

8. Whether Claim 10 is unpatentable under 35 U.S.C. § 103 (a) over U.S. Patent No. 6,492,065 to Nakagaki *et al.* in view of U.S. Patent No. 5,992,320 to Kosaka *et al.*
9. Whether Claim 11 is unpatentable under 35 U.S.C. § 103 (a) over U.S. Patent No. 6,492,065 to Nakagaki *et al.* in view of U.S. Patent No. 5,992,320 to Kosaka *et al.*
10. Whether Claim 12 is unpatentable under 35 U.S.C. § 103 (a) over U.S. Patent No. 6,492,065 to Nakagaki *et al.* in view of U.S. Patent No. 5,992,320 to Kosaka *et al.*

## ARGUMENT

### Ground of Rejection 1:

Claim 1 was rejected under 35 U.S.C. § 103 (a) over U.S. Patent No. 6,309,073 to Nakayama *et al.* ("Nakayama") in view of U.S. Patent No. 6,232,717 to Oida *et al.* ("Oida") and in further view of U.S. Patent No. 6,252,638 to Johnson *et al.* ("Johnson"). The applicant respectfully disagrees and submits the Examiner has failed to establish a *prima facie* case of obviousness.

"A person shall be entitled to a patent unless," creates an initial presumption of patentability in favor of the applicant. 35 U.S.C. § 102. "We think the precise language of 35 U.S.C. § 102 that, 'a person shall be entitled to a patent unless,' concerning novelty and unobviousness, clearly places a burden of proof on the Patent Office which requires it to produce the factual basis for its rejection of an application under sections 102 and 103, see *Graham* and *Adams*." *In re Warner*, 379 F.2d 1011, 1016 (C.C.P.A. 1967) (referencing *Graham v. John Deere Co.*, 383 U.S. 1 (1966) and *United States v. Adams*, 383 U.S. 39 (1966)). "As adapted to *ex parte* procedure, *Graham* is interpreted as continuing to place the 'burden of proof on the Patent Office which requires it to produce the factual basis for its rejection of an application

under sections 102 and 103'." *In re Piasecki*, 745 F.2d 1468 (Fed. Cir. 1984) (citing *In re Warner*, 379 F.2d at 1016).

"The *prima facie* case is a procedural tool which, as used in patent examination (as by courts in general), means not only that the evidence of the prior art would reasonably allow the conclusion the examiner seeks, but also that the prior art compels such a conclusion if the applicant produces no evidence or argument to rebut it." *In re Spada*, 911 F.2d 705, 708 n.3 (Fed. Cir. 1990).

"Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy." *Graham v. Deere*, 383 U.S. 1, 17-18 (1966).

"To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). 'All words in a claim must be considered in judging the patentability of that claim against the prior art.' *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)." MPEP § 2143.03.

"To support the conclusion that the claimed combination is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed combination or the examiner must present a convincing line of reasoning as to why the artisan would have found the

claimed invention to have been obvious in light of the teachings of the references." Ex parte Clapp, 227 U.S.P.Q. 972, 973 (Bd. Pat. App. & Inter. 1985).

The Examiner has failed to meet the duty of presenting a *prima facie* obviousness rejection. With respect to Claim 1, the Examiner stated, "Nakayama does not disclose "a color modulator comprised of a stack of at least two dielectric layers and at least three transparent electrodes, wherein a voltage applied to the electrodes limits the wavelengths of light permitted to continue on the light path.' Oida teaches a first, second and a third color filter layers (4R, 4G and 4B) which are formed in correspondence to the first, the second and the third X electrodes, and are transparent to red light, green light and blue light respectively. Oida also teaches transparent dielectric layer (5) covering the X electrodes in the color filters, and the dielectric layer (14) covering Y electrodes. See Fig. 11, Fig. 12, col. 17, lines 52-67 and col. 18, lines 1-9."

The applicant respectfully submits that the Examiner's analysis has completely ignored the language of the claims. Oida, in combination with Nakayama, does not show, teach, or suggest a "color modulator comprised of a stack of at least two dielectric layers and at least three transparent electrode layers" as recited by Claim 1.

The Examiner further stated, "Therefore, it would have been obvious to one having skill in the art at the time the invention was made to modify Nakayama's projection type display system to adapt Oida's color filtering with respect to X and Y electrodes as shown on Fig. 11. One would have been motivated in view of the suggestion in Oida that the dielectric layers (5, 14) along with a first, second, and third X electrodes (12) as configured in Fig. 11 meet the desired 'stack of two electrodes, and three transparent electrode.' The use of color filtering helps achieve a display system better color fidelity is taught by Oida."

The applicant respectfully submits that this clearly is not a suggestion to combine the two references or modify either reference to obtain the recited claim limitations. The Examiner is merely substituting Oida's plasma panel colored light source for Nakayama's color separation apparatus. Not only is there no suggestion in the prior art to make this modification, it is far from clear how substituting Oida's plasma display panel could even be made to work in Nakayama's display system.

The Examiner's first explanation of the motivation in the prior art necessary to support the modification, that the combination "meet the desired 'stack of two electrodes, and three transparent electrodes'" appears to have come not from the prior art, but instead appears to be a misquote of the applicant's own claimed invention.

The Examiner's only hint of a suggestion in the art, "The use of color filtering helps achieve a display system better color fidelity is taught by Oida" is unsupported by the prior art.

Examiner stated, "Nakayama does not teach a voltage applied to the electrodes limiting the wavelengths of light permitted to continue on the light path. Johnson on the other hand teaches light in the spectrum F, having a modulation state of polarization P.sub.m. and have its polarization state selectively altered depending upon the voltage applied to the modulator (10). See col. 7, lines 12-17. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nakayama's display system to adapt Johnson's technique of altering the polarization state of light. One would have been motivated in view of the suggestion in Johnson that selectively altering polarization state light resulting from a voltage application is functionally equivalent to limiting wavelengths of light resulting from voltage application. The use of altering polarization state of light helps function color a display system is taught in Johnson."

The Examiner states Nakayama doesn't teach a "color modulator comprised of a stack of at least two dielectric layers and at least three transparent electrode layers" as recited by Claim 1, but somehow tries to rectify this shortcoming by explaining that Johnson alters a polarization state using an applied voltage. Even the combination created by the Examiner fails to show, teach, or suggest a "color modulator comprised of a stack of at least two dielectric layers and at least three transparent electrode layers" as recited by Claim 1. Merely listing the component limitations of the claims out of context, or listing alternatives to the claimed limitations cannot—especially when such other techniques are mutually exclusive—cannot render Claim 1 obvious to one of ordinary skill in the art.

For the reasons stated above, the Examiner's rejection is unsupported by the prior art. The Examiner has not met the burden of presenting a *prima facie* case of obviousness. Therefore, the rejection under 35 U.S.C. § 103(a) is defective and should be withdrawn.

Ground of Rejection 2:

Claim 2 was rejected under 35 U.S.C. § 103 (a) over Nakayama in view of Oida and in further view of Johnson. The applicant respectfully disagrees and submits the Examiner has failed to establish a *prima facie* case of obviousness.

Claim 2 depends from Claim 1 and should be deemed allowable for that reason as presented above and further for reciting "a prism assembly for spatially separating an illumination segment of said light path from a projection segment of said light path" in combination with the additional limitations of Claim 1.

With respect to Claim 2, the Examiner stated, "Nakayama teaches the color synthesizing optical system (6) consisting of a dichroic prism. As shown in Fig. 1, the light valves (5R, 5G,

5B) are located between an illumination optical system (2A) and projection lens (7). See col. 7, lines 49-55."

The applicant respectfully submits Claim 2 should be deemed allowable for the very reasons stated by the Examiner. Claim 2 recites, "a prism assembly for spatially separating an illumination segment of said light path from a projection segment of said light path." Nakayama's light valves, not the dichroic prism as stated by the Examiner, separate the illumination path (through 2A, 4, and 9) from the projection path (through 6 and 7). Therefore, Nakayama's prism are not "spatially separating an illumination segment of said light path from a projection segment of said light path" as recited by Claim 2. The Examiner makes no attempt to read Oida and Johnson on the additional limitations of Claim 2.

For the reasons stated above, the Examiner's rejection is unsupported by the prior art. The Examiner has not met the burden of presenting a *prima facie* case of obviousness. Therefore, the rejection under 35 U.S.C. § 103(a) is defective and should be withdrawn.

Ground of Rejection 3:

Claim 3 was rejected under 35 U.S.C. § 103 (a) over Nakayama in view of Oida and in further view of Johnson. The applicant respectfully disagrees and submits the Examiner has failed to establish a *prima facie* case of obviousness.

Claim 3 depends from Claim 1 and should be deemed allowable for that reason as presented above and further for reciting "said color modulator is fabricated on a face of said prism assembly" in combination with the additional limitations of Claim 1.

With respect to Claim 3, the Examiner stated, "Nakayama teaches a color synthesizing optical system (6) that is of a mirror composite having dichroic mirrors arranged in "X" shape."

The applicant respectfully submits Claim 3 should be deemed allowable for the very reasons stated by the Examiner. Claim 3 recites, "said color modulator is fabricated on a face of said prism assembly." Nakayama's prism is not a "color modulator on said light path that limits the wavelengths of light permitted to continue on said light path" but rather a recombiner. Nakayama uses light valves (5R, 5G, 5B) as a color modulator which clearly are not "fabricated on a face of said prism assembly" as recited by Claim 3. The Examiner makes no attempt to read Oida and Johnson on the additional limitations of Claim 3.

For the reasons stated above, the Examiner's rejection is unsupported by the prior art. The Examiner has not met the burden of presenting a *prima facie* case of obviousness. Therefore, the rejection under 35 U.S.C. § 103(a) is defective and should be withdrawn.

Ground of Rejection 4:

Claim 4 was rejected under 35 U.S.C. § 103 (a) over Nakayama in view of Oida and in further view of Johnson. The applicant respectfully disagrees and submits the Examiner has failed to establish a *prima facie* case of obviousness.

Claim 4 depends from Claim 1 and should be deemed allowable for that reason as presented above and further for reciting "color modulator is fabricated on said spatial light modulator" in combination with the additional limitations of Claim 1.

With respect to Claim 4, the Examiner stated, "Nakayama teaches three liquid crystal panels 5R, 5G, and 5B as light valves for modulating the color beams, and a color synthesizing optical system (6) for synthesizing the modulated color beams."

The applicant respectfully submits Claim 4 should be deemed allowable for the very reasons stated by the Examiner. Claim 4 recites the "color modulator is fabricated on said spatial light modulator." As the Examiner points out, Nakayama's color combining prism (6), color

modulator (4), and spatial light modulator (5) are all separate devices. The color modulator (4) clearly is not fabricated on said spatial light modulator (5), and the Examiner makes no attempt to read Oida and Johnson on the additional limitations of Claim 4.

For the reasons stated above, the Examiner's rejection is unsupported by the prior art. The Examiner has not met the burden of presenting a *prima facie* case of obviousness. Therefore, the rejection under 35 U.S.C. § 103(a) is defective and should be withdrawn.

Ground of Rejection 5:

Claim 5 was rejected under 35 U.S.C. § 103 (a) over Nakayama in view of Oida and in further view of Johnson. The applicant respectfully disagrees and submits the Examiner has failed to establish a *prima facie* case of obviousness.

Claim 5 depends from Claim 1 and should be deemed allowable for that reason as presented above and further for reciting "spatial light modulator is a deformable mirror device" in combination with the additional limitations of Claim 1.

The Examiner stated, "Nakayama teaches three liquid crystal panels 5R, 5G, and 5B as light valves for modulating the color beams" and "Nakayama teaches projection type display system which includes the use of concave mirror (923) as shown in Fig. 15A."

The applicant respectfully submits Claim 5 should be deemed allowable for the very reasons stated by the Examiner. Claim 5 recites the "spatial light modulator is a deformable mirror device." As the Examiner points out, "Nakayama teaches three liquid crystal panels 5R, 5G, and 5B as light valves for modulating the color beams." Nakayama does not show, teach, or suggest a deformable mirror device, and even the non-deformable mirrors that are taught by Nakayama are part of a light guide system 9F which is physically, functionally, and conceptually separate from the spatial light modulators 5R, 5G, and 5B of Nakayama.

For the reasons stated above, the Examiner's rejection is unsupported by the prior art.

The Examiner has not met the burden of presenting a *prima facie* case of obviousness.

Therefore, the rejection under 35 U.S.C. § 103(a) is defective and should be withdrawn.

**Ground of Rejection 6:**

Claim 7 was rejected under 35 U.S.C. § 103 (a) over U.S. Patent No. 6,492,065 to Nakagaki *et al.* ("Nakagaki") in view of U.S. Patent No. 5,992,320 to Kosaka *et al.* ("Kosaka"). The applicant respectfully disagrees and submits the Examiner has failed to establish a *prima facie* case of obviousness.

The Examiner stated, "Regarding claims 7, 10 and 11, Nakagaki teaches a method of producing hologram color filter for diffracting and dispensing incident white light into lights of three primary colors of red, green and blue such that the method includes the use of a glass substrate and plurality of layers. See col. 2, lines 50-63, col. 7, lines 20-36 and Fig. 2. Nakagaki discloses a hologram color filter (20) with respect to an application of a voltage corresponding to a picture element between the picture elements electrode layer 5 and transparent electrode layer 4 of the incident side. See col. 7, lines 50-60."

The applicant respectfully submits, Nakagaki teaches a "space light modulating element 3" which is a transparent electrode layer 4, picture element electrode layer 5, and liquid crystal 6.

The Examiner further states, "Nakagaki does not teach alternating layers of electrodes and dielectric materials. Kosaka on the other hand teaches a first transfer sheet, which is electrode-forming layer, and second transfer sheet, which is a dielectric forming layer. See col. 2, 18-21 and lines 57-62."

The Examiner's admission that Nakagaki does not teach alternating layers of electrodes and dielectric materials" is not cured merely by Kosaka teaching an electrode forming layer and

a dielectric forming layer. The prior art, taken as a whole does not show, teach, or suggest the limitations of Claim 7, including "alternating layers of electrodes and dielectric materials, wherein voltages applied to said electrodes are operable to filter an incident white light beam into a light beam of one of three primary colors" as recited by Claim 7.

The Examiner stated, "it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nakagaki's color display unit to adapt Kosaka's electrode forming layer and dielectric forming layer." Far from being obvious to combine, it is far from obvious how to combine a liquid crystal addressed hologram color filter with a transfer sheet which is suitable for forming high-precision patterns. Additionally, even if the combination yielded the claimed invention, which it clearly does not, the Examiner has failed to show the required teaching or suggestion in the prior art to made the combination or modification.

The Examiner stated, "One would have been motivated in view of the suggestion in Kosaka that the electrode forming and dielectric forming layers can be utilized to achieve the desired "alternating layers of electrodes and dielectric materials." The applicant respectfully submits the Examiner has failed to point to any such suggestion in Kosaka, but rather appears to merely be using the applicants own claims as the motivation for the modification.

For the reasons stated above, the Examiner's rejection is unsupported by the prior art. The Examiner has not met the burden of presenting a *prima facie* case of obviousness. Therefore, the rejection under 35 U.S.C. § 103(a) is defective and should be withdrawn.

Ground of Rejection 7:

Claim 8 was rejected under 35 U.S.C. § 103 (a) over Nakagaki in view of Kosaka. The applicant respectfully disagrees and submits the Examiner has failed to establish a *prima facie* case of obviousness.

Claim 8 depends from Claim 7 and should be deemed allowable for that reason as presented above and further for reciting "said dielectric material are selected from the group consisting of, LiNbO<sub>3</sub>, LiTaO<sub>3</sub>, NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub>, KH<sub>2</sub> PO<sub>4</sub>, and CdTe" in combination with the additional limitations of Claim 7.

With respect to Claim 8, the Examiner stated, "Kosaka teaches a dielectric-forming layer with respect use of polymers or copolymers or other materials. See col. 13, line 53-65."

The applicant respectfully submits that this is inaccurate. The cited passage of Kosaka actually states, "The thermoplastic resin used herein may be those referred to in connection with the aforesaid concave pattern-forming material. However, it is preferable to use polymers or copolymers comprising at least one of methyl acrylate, methyl methacrylate, ethyl acrylate, ethyl methacrylate, n-propyl acrylate, n-propyl methacrylate, isopropyl acrylate, isopropyl methacrylate, n-butyl methacrylate, n-butyl acrylate, sec-butyl acrylate, sec-butyl methacrylate, isobutyl acrylate, isobutyl methacrylate, tert- butyl acrylate, tert-butyl methacrylate, hydroxyethyl acrylate, hydroxyethyl methacrylate, hydroxypropyl acrylate, hydroxypropyl methacrylate, 2-ethylhexyl methacrylate, and 2-ethylhexyl acrylate, ethyl cellulose, and polybutene derivatives."

Claim 8 recites, "said dielectric material are selected from the group consisting of, LiNbO<sub>3</sub>, LiTaO<sub>3</sub>, NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub>, KH<sub>2</sub> PO<sub>4</sub>, and CdTe." Thus, in spite of a laundry list of resins, Nakagaki in view of Kosaka does not appear to show, teach, or suggest the limitations of Claim 8. The Examiner's rejection therefore is unsupported by the prior art. The Examiner has not met

the burden of presenting a *prima facie* case of obviousness. Therefore, the rejection under 35 U.S.C. § 103(a) is defective and should be withdrawn.

Ground of Rejection 8:

Claim 10 was rejected under 35 U.S.C. § 103 (a) over Nakagaki in view of Kosaka. The applicant respectfully disagrees and submits the Examiner has failed to establish a *prima facie* case of obviousness.

Claim 10 recites “filtering said beam of white light to produce a primary color beam of light, said filtering step performed by passing said beam of white light through a stack of at least two dielectric layers, at least one of said dielectric layers exposed to an electric field . . . and altering electrical signals biasing said stack of dielectric layers such that said primary color beam of light alternates between three primary colors.”

The Examiner stated, “Regarding claims 7, 10 and 11, Nakagaki teaches a method of producing hologram color filter for diffracting and dispensing incident white light into lights of three primary colors of red, green and blue such that the method includes the use of a glass substrate and plurality of layers. See col. 2, lines 50-63, col. 7, lines 20-36 and Fig. 2. Nakagaki discloses a hologram color filter (20) with respect to an application of a voltage corresponding to a picture element between the picture elements electrode layer 5 and transparent electrode layer 4 of the incident side. See col. 7, lines 50-60.”

The applicant respectfully submits, Nakagaki teaches a “space light modulating element 3” which is a transparent electrode layer 4, picture element electrode layer 5, and liquid crystal 6.

The Examiner further states, “Nakagaki does not teach alternating layers of electrodes and dielectric materials. Kosaka on the other hand teaches a first transfer sheet, which is

electrode-forming layer, and second transfer sheet, which is a dielectric forming layer. See col. 2, 18-21 and lines 57-62."

The Examiner's admission that Nakagaki does not teach alternating layers of electrodes and dielectric materials" is not cured merely by Kosaka teaching an electrode forming layer and a dielectric forming layer. The prior art, taken as a whole does not show, teach, or suggest the limitations of Claim 10, including "altering electrical signals biasing said stack of dielectric layers such that said primary color beam of light alternates between three primary colors" as recited by Claim 10.

The Examiner stated, "it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nakagaki's color display unit to adapt Kosaka's electrode forming layer and dielectric forming layer." Far from being obvious to combine, it is far from obvious how to combine a liquid crystal addressed hologram color filter with a transfer sheet which is suitable for forming high-precision patterns. Additionally, even if the combination yielded the claimed invention, which it clearly does not, the Examiner has failed to show the required teaching or suggestion in the prior art to make the combination or modification.

The Examiner further stated, "It would have been obvious to utilize the hologram color filter described above with respect to Kosaka's dielectric forming layers in order to achieve "primary color beam of light alternating between three primary colors." Far from being obvious to combine, it is far from obvious how to combine a liquid crystal addressed hologram color filter with a transfer sheet which is suitable for forming high-precision patterns. Additionally, even if the combination yielded the claimed invention, which it clearly does not, the Examiner

has failed to show the required teaching or suggestion in the prior art to make the combination or modification.

For the reasons stated above, the Examiner's rejection is unsupported by the prior art.

The Examiner has not met the burden of presenting a *prima facie* case of obviousness.

Therefore, the rejection under 35 U.S.C. § 103(a) is defective and should be withdrawn.

Ground of Rejection 9:

Claim 11 was rejected under 35 U.S.C. § 103 (a) over Nakagaki in view of Kosaka. The applicant respectfully disagrees and submits the Examiner has failed to establish a *prima facie* case of obviousness.

Claim 11 recites "alternating layers of electrodes and dielectric materials, wherein voltages applied to said electrodes are operable to filter an incident white light beam into a light beam sequentially comprised of each of three primary colors."

The Examiner stated, "Regarding claims 7, 10 and 11, Nakagaki teaches a method of producing hologram color filter for diffracting and dispensing incident white light into lights of three primary colors of red, green and blue such that the method includes the use of a glass substrate and plurality of layers. See col. 2, lines 50-63, col. 7, lines 20-36 and Fig. 2. Nakagaki discloses a hologram color filter (20) with respect to an application of a voltage corresponding to a picture element between the picture elements electrode layer 5 and transparent electrode layer 4 of the incident side. See col. 7, lines 50-60."

The applicant respectfully submits, Nakagaki teaches a "space light modulating element 3" which is a transparent electrode layer 4, picture element electrode layer 5, and liquid crystal 6.

The Examiner further states, "Nakagaki does not teach alternating layers of electrodes and dielectric materials. Kosaka on the other hand teaches a first transfer sheet, which is

electrode-forming layer, and second transfer sheet, which is a dielectric forming layer. See col. 2, 18-21 and lines 57-62."

The Examiner's admission that Nakagaki does not teach alternating layers of electrodes and dielectric materials" is not cured merely by Kosaka teaching an electrode forming layer and a dielectric forming layer. The prior art, taken as a whole does not show, teach, or suggest the limitations of Claim 11, including "alternating layers of electrodes and dielectric materials, wherein voltages applied to said electrodes are operable to filter an incident white light beam into a light beam sequentially comprised of each of three primary colors" as recited by Claim 11.

The Examiner stated, "it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nakagaki's color display unit to adapt Kosaka's electrode forming layer and dielectric forming layer." Far from being obvious to combine, it is far from obvious how to combine a liquid crystal addressed hologram color filter with a transfer sheet which is suitable for forming high-precision patterns. Additionally, even if the combination yielded the claimed invention, which it clearly does not, the Examiner has failed to show the required teaching or suggestion in the prior art to made the combination or modification.

For the reasons stated above, the Examiner's rejection is unsupported by the prior art. The Examiner has not met the burden of presenting a *prima facie* case of obviousness. Therefore, the rejection under 35 U.S.C. § 103(a) is defective and should be withdrawn.

Ground of Rejection 10:

Claim 12 was rejected under 35 U.S.C. § 103 (a) over Nakagaki in view of Kosaka. The applicant respectfully disagrees and submits the Examiner has failed to establish a *prima facie* case of obviousness.

Claim 12 depends from Claim 11 and should be deemed allowable for that reason as presented above and further for reciting "said dielectric material are selected from the group consisting of,  $\text{LiNbO}_3$ ,  $\text{LiTaO}_3$ ,  $\text{NH}_4\text{H}_2\text{PO}_4$ ,  $\text{KH}_2\text{PO}_4$ , and  $\text{CdTe}$ " in combination with the additional limitations of Claim 11.

With respect to Claim 12, the Examiner stated, "Kosaka teaches a dielectric-forming layer with respect use of polymers or copolymers or other materials. See col. 13, line 53-65."

The applicant respectfully submits that this is inaccurate. The cited passage of Kosaka actually states, "The thermoplastic resin used herein may be those referred to in connection with the aforesaid concave pattern-forming material. However, it is preferable to use polymers or copolymers comprising at least one of methyl acrylate, methyl methacrylate, ethyl acrylate, ethyl methacrylate, n-propyl acrylate, n-propyl methacrylate, isopropyl acrylate, isopropyl methacrylate, n-butyl methacrylate, n-butyl acrylate, sec-butyl acrylate, sec-butyl methacrylate, isobutyl acrylate, isobutyl methacrylate, tert- butyl acrylate, tert-butyl methacrylate, hydroxyethyl acrylate, hydroxyethyl methacrylate, hydroxypropyl acrylate, hydroxypropyl methacrylate, 2-ethylhexyl methacrylate, and 2-ethylhexyl acrylate, ethyl cellulose, and polybutene derivatives."

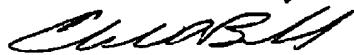
Claim 12 recites, "said dielectric material are selected from the group consisting of,  $\text{LiNbO}_3$ ,  $\text{LiTaO}_3$ ,  $\text{NH}_4\text{H}_2\text{PO}_4$ ,  $\text{KH}_2\text{PO}_4$ , and  $\text{CdTe}$ ." Thus, in spite of a laundry list of resins, Nakagaki in view of Kosaka does not appear to show, teach, or suggest the limitations of Claim 12. The Examiner's rejection therefore is unsupported by the prior art. The Examiner has not met the burden of presenting a *prima facie* case of obviousness. Therefore, the rejection under 35 U.S.C. § 103(a) is defective and should be withdrawn.

**CONCLUSION**

For the foregoing reasons, Appellants respectfully submit that the Examiner's final rejection of Claims 1-13 is improper, and it is respectfully requested that the Board of Patent Appeals and Interferences so find and reverse the Examiner's rejection.

Please charge any fees necessary in connection with the filing of this paper, including any necessary extension of time fees, to Deposit Account No. 20-0668 of Texas Instruments Incorporated.

Respectfully submitted,



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## CLAIMS APPENDIX

1. (Previously presented) A color display system comprising:
  - a light source for providing a beam of white light along a light path;
  - at least one color modulator on said light path, said color modulator comprised of a stack of at least two dielectric layers and at least three transparent electrode layers, wherein a voltage applied to said electrodes limits the wavelengths of light permitted to continue on said light path;
  - a controller;
  - a spatial light modulator on said light path, said spatial light modulator operable to selectively modulate incident light in response to signals from said controller; and
  - projection optics on said light path operable to focus light from said spatial light modulator on an image plane.
2. (Original) The display system of Claim 1, further comprising a prism assembly for spatially separating an illumination segment of said light path from a projection segment of said light path, said spatial light modulator located at a junction between said illumination segment and said projection segment.
3. (Original) The display system of Claim 2, wherein said color modulator is fabricated on a face of said prism assembly.
4. (Original) The display system of Claim 1, wherein said color modulator is fabricated on said spatial light modulator.
5. (Original) The display system of Claim 1, wherein said spatial light modulator is a deformable mirror device.
6. (Original) The display system of Claim 1, wherein said spatial light modulator is a liquid

crystal device.

7. (Original) A color modulator comprising:

a substrate;

alternating layers of electrodes and dielectric materials, wherein voltages applied to said electrodes are operable to filter an incident white light beam into a light beam of one of three primary colors.

8. (Original) The color modulator of Claim 7, wherein said dielectric material are selected from the group consisting of, LiNbO<sub>3</sub>, LiTaO<sub>3</sub>, NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub>, KH<sub>2</sub>PO<sub>4</sub>, and CdTe.

9. (Original) The color modulator of Claim 7, said electrodes formed of Indium Tin Oxide.

10. (Previously presented) A method of creating a full-color image, the method comprising the steps of:

providing a beam of white light;

filtering said beam of white light to produce a primary color beam of light, said filtering step performed by passing said beam of white light through a stack of at least two dielectric layers, at least one of said dielectric layers exposed to an electric field; selectively modulating portions of said primary color beam of light to produce an image-bearing beam of light; and

focusing said image-bearing beam of light on an image plane; and  
altering electrical signals biasing said stack of dielectric layers such that said primary color beam of light alternates between three primary colors.

11. (Previously presented) A color modulator comprising:

a substrate;

alternating layers of electrodes and dielectric materials, wherein voltages applied

to said electrodes are operable to filter an incident white light beam into a light beam sequentially comprised of each of three primary colors.

12. (Previously presented) The color modulator of Claim 11, wherein said dielectric material are selected from the group consisting of,  $\text{LiNbO}_3$ ,  $\text{LiTaO}_3$ ,  $\text{NH}_4\text{H}_2\text{PO}_4$ ,  $\text{KH}_2\text{PO}_4$ , and  $\text{CdTe}$ .
13. (Previously presented) The color modulator of Claim 11, said electrodes formed of Indium Tin Oxide.